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Planning for Change: The Forms and Flows of Lisbon Metropolitan Area Food System

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1. Introduction

The aim of this paper is to introduce the goals and some preliminary results of a research Project 'SPLACH – Spatial Planning for Change', financed by European Funds through Portugal 2020 Program, which aims to contribute with new knowledge for a desirable shift of existing urban planning policies, in order to promote a low carbon and social inclusive urban system. SPLACH is about the role of cities, city networks, urban regions, metropolitan regions, and of spatial planning, in addressing structural changes (from crisis and post-crisis issues to climate change issues) and the societal challenges associated to those changes. In order to contribute to the debate placed by SPLACH, this paper focusses its analysis on the contributions of two specific working packages prepared for SPLACH Project, which deals specifically with the thematic of Urban Planning and Food, namely: i) Transition paths to urban sustainability; and ii) Food Security and Sustainability.

2. Climate Change and the society request for Sustainability

Cooling the planet and improving the environment of our cities emerges as a collective social duty to which urban planners, urban dwellers, but also urban policymakers, should respond equally to counteract the effects of the occurring climate change, as argued within major international policies, ratified by most members of the United Nations, including the Paris Agreement (United Nations, 2015a), and the Sustainable Development Goals (United Nations, 2015b).

Guiding the work of urban planners and policymakers, as well as the choices and daily practices of urban dwellers, in order to practice such Sustainability goals and agreement, emerges therefore as a crucial task. One, that should contribute to understand and intervene over the deep structure of cities, while acknowledging how the urban realm works and functions in terms of its various networks and respective flows (Batty, 2013).

A number of efforts, applied at the municipal level, are deemed to be identified as important contributions to respond to such request, at the same time that do emphasize the social and ecological dimensions of Sustainability, to which 'The New Urban Agenda' (United Nations, 2017) should also respond. For example, the recent Milan Urban Food Policy Pact (MUFPF, 2015) acknowledges the strategic role of cities and municipalities in promoting sustainable food systems, whereas enhancing food security and nutrition for healthy and equitable territories. Moreover, this Food Policy Pact reinforces the idea that is precisely at the municipal level, where urban agriculture and food provision can contribute to centre such debate on the urban planning sphere. Nevertheless, neither the urban forms that have been explored to respond to such problematic appear to have been sufficiently investigated (Lo, 2016; Parham, 2015), nor the processes of living, consuming and producing in cities, in which are included the social and economic flows that sustain the urban food system, appear to have also sufficiently investigated (Neuman, 2005). Therefore, a comprehensive approach to the metabolic function of cities, which could contribute to inform on how to optimize the efficiency of an existing urban fabric (Thomson and Newman, 2018), for example in terms of its food system functioning has not been sufficiently investigated.

In order to contribute to this debate, this paper argues for an integration of food within urban planning to support future planning policies and urban form guidance, that while emphasizing the metabolic functioning of the urban realm, could catalyse a desirable urban sustainability transition of the current urban system. Therefore, this paper aims to discuss the theoretical and methodological framework that has guided SPLACH project to approach the food system problematic, while dissecting the urban forms and the social-economic flows that affect the urban metabolic function of the urban realm. The research that is conducted at this project shall be applied in Lisbon Metropolitan Area (LMA), where most of Portuguese citizens live and work. In order to do so this paper aims to focus on the forms and flows, which seem to have been determinant within LMA food system, while scrutinizing possible typologies and relations, among them, which are deemed to be evaluated from a metabolic perspective. This theoretical and methodological framework aims to guide a possible analysis of the food system of LMA, whereas informing future analysis applicable to other areas.

3. Food and Urban Planning: towards a systemic approach of the socio-ecological urban system

“Planning can and should constitute a sustainable transformative device for our cities in Europe and elsewhere, and particularly in times when environmental and societal pressures are being assigned. Indeed, current practices and behavioural changes seem far deeper within existing urban fabrics where a profound reorganization of functions and activities are occurring, when compared to urban areas, where past investments in infrastructures and in the built environment seemed to have exceeded the real demand and generated a surplus of the building stock, which in some cases remain partially empty or underused” (SPLACH Project brief, 2017).

In order to identify possible areas where urban planning could contribute to a sustainable transformation of the current urban system, the SPLACH Project was prepared for financial evaluation of the Program Portugal 2020, co-financed with European and Portuguese funds. This Project, coordinated by the University of Porto, was prepared with the contribution of the main areas of knowledge of three Portuguese research centres respectively, namely: i) CITTA, from the University of Porto; ii) DINÂMIA'CET-IUL, from Lisbon University Institute ISCTE-IUL; and iii) GOVCOPP, from the University of Aveiro. While the first centre is specialized in the areas of urban metabolism and urban planning and transport, the second research centre focus on the socio-economic perspective of the metabolic functioning of cities, Urban Morphology and Sustainability Transitions; and the third centre on issues related to Tourism and Urban Modelling. Furthermore, two to three main areas of knowledge were identified for each of these centres, respectively: post carbon cities, transformative policies, spatial planning, socio-technical system, food security, services of general interest, tourism and modelling. *“Based on these areas of knowledge and on the research strategy of each centre, seven Work Packages (WP) were identified for the SPLACH Project: 1) contemporary spatial dynamics, 2) transition paths, 3) food security and sustainability, 4) urban metabolism, 5) sustainable tourism, 6) planning services of general interest in times of austerity, 7) the potential of transformation of public policies. Finally, a further WP on urban modelling will congregate the contributions from the previous WP”* (SPLACH Project brief, 2017).

“The main objective of the SPLACH Project is to produce a comprehensive and coherent body of development control and transformative planning policies, implementation mechanisms, planning models and decision support systems, able to guide Portuguese planning practice, including both the public and the private sectors, at the plan making and the licensing stages - towards a rapid and effective transition to a low carbon and social inclusive urban system” (SPLACH Project brief, 2017). The overall team of SPLACH Project includes Architects, Civil Engineers, Economists, Environmental Engineers, Geographers, Landscape Architects, Sociologists and Urbanists.

The work that is being introduced in this paper, regards in particular the line of thought which has been followed at DINÂMIA'CET-IUL, in order to contribute to the SPLACH Project,

throughout the development of two specific but interlinked working packages, namely: 'Transitions Paths to Urban Sustainability' and 'Food security and Sustainability'. Furthermore, the research team that embraces the development of these two specific WP includes a multidisciplinary background, which includes Architects, Economists, Geographers, Sociologists and Urbanists.

3.1 Transitions paths to urban sustainability

"Transitions paths to urban sustainability is a Work Package that is built upon a theoretical framework where the concept of Socio-Technical Systems (SST) is central. SST are sets of linkages between elements that are necessary to perform the big societal functions such as communication, energy, housing, transport and nutrition. The main goal of this WP is to produce new knowledge that supports the reading of a possible transition of the current function of SST towards sustainability, informing future territorial oriented policies on how to allow such transition process. Research developed at DINÂMIA-CET, over the last years, includes a number of financed projects which have covered this issue, wherein applied at Lisbon Metropolitan Area (for example the MEMO and the PERIURBAN Research Projects) - its main case study, while covering different but specific problematics, such as land use, housing distribution, access to water facilities and agriculture uses". (SPLACH Project brief, 2017).

"The main strategy of the WP 'Transitions Paths to Urban Sustainability' is to draw on the available body of knowledge of the various disciplinary areas present at DINÂMIA-CET SPLACH Project research team, in order to support the reading of future areas of interest for the sustainability transition of the current functioning of the food system, in order to inform future urban policies.

Territory oriented policies, in general, and urban policies, in particular, constitute one of the main dimensions within such reflection for the achievement of urban sustainability. The implementation of a strategy towards a more sustainable city and of urban form (Marat-Mendes, 2002, 2013) and the shift to a new societal paradigm involves policy-driven actions aiming at land uses, territory planning and environmental issues (Marat-Mendes, 2014). Therefore, the analysis of SST and of Urban Metabolism includes the identification and the critical assessment of policies concerning Urban Planning, Agriculture, Rural Development and Environment" (SPLACH Project brief, 2017).

"Land use and the development of economic activities in metropolitan areas are influenced by the classification of land through urban planning policies, which may present multi-level and multi-scale nature. Agriculture and rural development activities have an important role in the reflection of sustainability, including in the design of metropolitan areas. Therefore, agriculture and rural development policies are at the core of the debate on paradigmatic changes involving those areas. The financial support and the regulation of farm and rural activities supported by these policies have direct and multidimensional impacts on the territory and should be assessed in the debate on sustainability and urban metabolism. In addition, environment and ecological values do determine policies on land use restrictions and territory planning. This is the case of the Habitats Directive, the European Natura Network 2000 and legislation on Agricultural and Ecological Protected Areas integrated in territorial urban planning tools. Environmental policy includes other regulations and mandatory actions like EIA of projects with territorial relevant impacts in multiple dimensions. To sum up, the policy-driven strategy towards sustainability and the design of urban metabolism should also address the identification of policies which present important impacts on land use and territorial development, as here proposed" (SPLACH Project Program, 2017).

3.2 Food security and Sustainability

"The main goal of the Work Package entitled 'Food Security and Sustainability' is to design a strategy that integrates concerns of food security with spatial issues towards a

Post-Carbon City (PCC). This Work Package aims to provide an evaluation of the specific nutrition SST of Lisbon Metropolitan Area, while establishing a possible methodology which can be applied on other urban areas. This Work Package is established on the assumption that the nutrition SST is very relevant to sustainability and as such can contribute to a future agenda for a PCC, as already advocated by a number of political and scientific agendas (e.g., Europe 2020; EU Common Agricultural Policy; and Milan Urban Food Policy Pact). The acknowledgement of this issue is in line with the multidimensional approach to sustainability and the resilience of cities, which should consider the current main societal challenges such as food security, at different scales of approach in simultaneously. A number of complementary approaches to access the nutrition SST, including urban metabolism, food security, and technological and social innovation, accessed in the above identified working package 'Transitions paths to urban sustainability' are therefore determinant to inform the methodological approach that will be here followed. In addition, distinctive methods, tools and sources with interest to the investigation, which contribute to build the main analytical framework of the investigation, will also be identified during the development of this Work Package. Likewise, a number of relevant case studies carried out in other contexts will be used.

This framework should provide views on the impact of production, distribution and access to food at different territorial scales.

The proposed framework acknowledges the analysis of the food SST of LMA, in a sustainability perspective, while prompting for an identification of the: (i) main obstacles that operate in the dominant system, in practice; (ii) the new and emerging experiences which are taking place in LMA, at present; and (iii) the characterization of the SST landscape of LMA" (SPLACH Project brief, 2017).

"This Work Package draws upon previous research developed at DINÂMIA'CET, which included PERIURBAN, MEMO and TESSⁱⁱ Projects. In particular, the first two have investigated the changes occurred in the territory of LMA in terms of land use, water infrastructures, agriculture, food and other resources, both in a historical and contemporary perspective, while making use of multidisciplinary methodological approaches, which have allowed the direct interaction with the main actors involved in the study area, and of varied methodological contributions from various disciplinary areas, from the social sciences mostly. The final output of this Work Package shall be the characterization of the nutrition SST of LMA; the identification of the key factors and agents able to promote change towards sustainability; and the construction of an analytical framework applicable to other contexts" (SPLACH Project brief, 2017).

4. The Food System. Concepts and main approaches

Following the introduction to the SPLACH project and to the two specific Work Packages, within which the relationship between the Food System and Urban Planning will be examined at SPLACH Project, the present section aims to introduce the preliminary results of the Food System literature review analysis, conducted at DINÂMIA'CET-IUL Research team, in order to identify how is the Food System defined and approached within current scientific literature, in particular dedicated to urban planning issues.

From the identified literature, it is possible to verify that there has been an increasing interest to the thematic of the Food System, from the scientific community, as testified by the available number of publications (articles and books) but also institutional and governmental reports. From this growing body of literature, it is also possible to identify a common ground of covenant in what regards the definition of food system itself. Unanimously described as a system of activities across which food is produced, processed, distributed, cooked, eaten and disposed. Within this description, other elements are also included, such as: i) the activities which are performed within the several steps of the food system; ii) the institutions and the actors which are related to those activities (Pothukuchi and Kaufman, 2000, p.113); iii) as well as the power relations established throughout such activities processes (Wekerle and Classens, 2015, p. 1178).

Consequently, this identified agreed basic definition of the food system seems apparently have contributed to the construction of an unanimous analytical methodological approach of the food system, which is mostly guided of a process of desegregation of the food system itself. Thus, allowing the reading of the food system throughout its several elements and layers of contact, among its different scales of resolution (including the individual and the collective, the public and the private, the local and the global, among others). Interestingly, Reisch et al (2013) have employed the term 'integrative paradigm' to define an adequate methodology towards the reading of the food system.

The definition itself and the above identified methodological approach has been able to place a number of problematics among the scientific community, namely: i) the impacts of the agri-businesses and the economies of scale, which have affected the western world and in greater level the emerging countries, throughout their processes of modernization of agriculture industry (Battersby, 2017; Steel, 2013); ii) the problematic of the high fragmentation character of the food industry (Reisch et al, 2013) which have urged a number of calls towards the need for interdisciplinary links between this field of study and urban planning (Brinkley, 2013; Cabannes and Raposo, 2013); iii) the fact that the food system has been left predominantly to the private sector in most western cities (Pothukuchi and Kaufman, 2000); and iv) the transformation that is occurring within the food system due to the absence of a food system planning (Battersby, 2017); among others.

Interestingly, it is precisely at the domains of the several points of contact of the food system (which integrates the social, the economic and political spheres) and on the best way to approach them towards a sustainability transition of the food system, where one finds however less consensus among the scientific community. This situation reflects a contemporary opposite positions towards the specific problematics, which affect society and the environment. For example, in what regards the level of acceptance of the neoliberalism position or the domain of the private market over the cities and its public space, but also the existing social inequalities (Cabannes and Raposo, 2013; Drago, 2018) and the sustainability threats (Cohen and Ilieva, 2015; Fischer-Kowalski and Weisz, 2016). These in turn, contribute to question which institutional structures or solutions of power distribution, do respond better to such urban systems and problematics.

In what regards the food system, its link to society, either in terms of subsistence, access to food, health issues, or its organization within space is paramount to the sustainability of the urban environment (WCDE, 1987; United Nations, 2015b; Mazzocchi and Marrino, 2017). Accordingly, Gandy (2006, 2004) identifies the functioning of any urban system, as determinant to the metabolic function of the urban environments, in all its various dimensions (social, environmental and physical for example). Therefore, understanding the functioning of the food system do contributes to rethink a new conceptual framework, which promotes a new imagine of how different institutions (which results from a social organization) could eventually respond in a closely manner to the society demands, across a variety of scales of space but also governance (Webb et al, 2018).

The relationship of the food system with the spatial dimension of the urban system (urban form) emerges therefore as a critical point. However, this has been mostly disregarded among the available literature, as already argued by a number of researchers (see for example: Cabannes and Raposo, 2013; Pothukuchi and Kaufman, 2000; and Brinkley, 2013).

From the available literature dedicated to the study of the food system and with interest to urban planning one should recall Carolyn Steel's book 'Hungry City – How food shapes our lives' (Steel, 2013) and Susan Parham's book 'Food and Urbanism' (Parham, 2015), for expanding the discussions on food system within the domains of urban planning, wherein focusing on issues such as urban agriculture and urbanism, which were initiated in the beginning of 2000's with Kameshwari Pothukuchi and Jerome Kaufman.

The research initiated by Pothukuchi and Kaufman (2000), based on an inquiry to planning agencies and institutions, concluded that most problems associated with the food system were expected to be resolved by the private sector, exposing however that the public planning authorities would be unable to ascertain its role.

It would be later in 2013 that two published works would underline the interest that the food system was gaining from the scientific community. One by Catherine Brinkley (2013) 'Avenues into food planning: a review of scholarly food system research', which would provide a comprehensive literature review, focusing on several aspects which has been approached by studies about the food system. Furthermore, Brinkley attention was mostly placed on recaps previous holistic definitions of the food system. Yet, it identified two specific areas, which were being missed in the food system literature: cultural capital and waste-disposal.

The second work regards the publication of the journal 'International Planning Studies', which in 2013 would dedicate an entire issue to the thematic the food system planning. Edited by Kevin Morgan (2013), issue 1 of volume 18 of this journal comprised an editorial text and eight papers dedicated to the rise of the food system in urban planning, while integrating both theoretical discussions but also the analysis of specific case studies from varied geographical contexts and problematics.

Interestingly, it was at the economics domain that the urban form, understood as the configuration of fixed metropolitan elements, which comprises several important features of cities, including density, compactness and land-use (Lo, 2016), emerges as an important issue to be considered within the analysis of the food system. Specifically, in what regards the increasing importance to the food system with a required analysis of sustainability transitions, which is in turn highly dependent on individual and community patterns of behaviour, mostly of households and communities (Lo, 2016). Understanding the behavioural dimensions of both sustainability (Lo, 2016) and the food system (Timmer, 2012), emerges also as an unexplored area particularly with respect to the food system. This includes dietary problems which despite their recurrent problematization in health scientific community but also urban planning (see for example Drewnowski et al, 2016 and Jiao et al, 2016), are not widely discussed in food system papers. Steel (2013) is again a very important exception, as her book explores consumption patterns and dietary behaviours in her discussion of the food system.

Furthermore, not only urban planning appears to have disregarded the analysis of the food system, despite the growing literature on this thematic, as the several layers of the food system seem also have received different levels of attention from the scientific community. For example, preference seems to have been placed on the food production level, when compared for example with consumption, distribution or even preparation phases. In turn, the urban planning responses to these specific problematics do find also different echo's, whereas the predominant one seems to be on the urban agriculture, at the production stage, linked to a particular fascination for the creation of a 'productive multifunctional landscape' (Viljoen & Bohn, 2012). However, this is a situation that places into question the social role of a future urban agenda, and of the planner's professions, as the agricultural labour that could shape such landscape has largely decreased since the 1970's, to the point of almost despairing within the western world (Fisher-Kowalski, Hass, 2014).

Although urban agriculture is also being studied by itself as a social and even political movement, there are many reasons why it is being so stressed within the food system literature. One important aspect is that the production phase of the food system is where most environmental implications are located, including land-use, soil degradation, water consumption and pollution, eutrophication, biodiversity loss, and introduction of hazardous chemicals (Reisch et al, 2013). On the other hand, industrial agriculture itself is a problem in terms of metabolism, as it is mostly dependent on non-renewable energy sources, with deep implication in Net Primary Production – energy fixed by autotrophic organisms – which is at the basis of heterotrophic food chains and accumulation of carbon stocks in soil (Erb et al, 2016).

As most planning activities are related to urban soil, and specifically into the organizing and development of built areas, the reconceptualizing of urban land and urban landscape to include productive areas (Viljoen and Bohn, 2012) merges as a critical debate. An understanding of the socio-metabolic implications of this problem is important, as different types of land-use will translate into different advantages and potential sustainability pitfalls.

Land-use intensity, rather than land-cover seems to be a more productive option, although it entails problems on its own, including soil degradation, groundwater and air pollution and biodiversity loss (Fischer-Kowalski and Weisz, 2016; Erb et al, 2016).

People living in cities must recognize themselves as selective agents in the determination of what species can and cannot live in cities, including the possibility of reducing the number and variety of native species of a given territory (Alberti: 2015,115). Thus, this place into question the participative level those urban citizens should take in the future urban agenda and the social role of planners themselves in such a process of sustainability transitions

5. Searching for Forms and Flows of the Food System. Towards a social-ecological reading of its metabolic behavior: LMA case study

As in many other European cities, LMA has witnesses in particular after the financial crisis of 2008 a number of new situations, related to the food system, in terms of the urban fabric but also of new social and economic practices. However, what are the impacts of these changes on the metabolic function of the city? What lessons can we retrieve from these to regenerate the urban realm in a Sustainable manner? Finally, further work of Project SPLACH aims to contribute to clarify to some of these questions, and therefore offer a more territorialized and spatialized clues about the metabolic function of cities.

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